

Night vision system improves capabilities

by Fred Coleman, Materials and Manufacturing Directorate

WRIGHT-PATTERSON AFB, OHIO — Marconi Aerospace Defense Systems and Planar Systems Inc., under a contract with Air Force Research Laboratory's Materials and Manufacturing Directorate, have developed a Night Vision Enhanced Heads Up Display (NVIS EHUD) with dramatically improved capabilities.

The new EHUD is lighter, more reliable, less expensive and uses commercial off-the-shelf components, which reduces the threat of obsolescence faced by military-unique electronics. With less than a \$1 million investment, the system is expected to save more than \$6 million initially. Additional savings will be realized if the system is used on Army and Navy aircraft.

Special operations aircrews must fly at very low levels at night. Night vision goggles provide the capability to see in very low light, but pilots must be aware of critical aircraft flight data information without looking into the cockpit. Heads Up Displays (HUD) integrated with night vision goggles help satisfy these needs, but the current system is costly, heavy, unreliable, and impedes movement in the cockpit. The Air Force needed more affordable technology, with higher reliability, greater functionality and greater safety.

The Defense Production Act (DPA) Title III Program Office initiated this project to qualify a night vision HUD system incorporating small format active matrix electroluminescent (AMEL) flat panel displays, and to help establish a viable domestic production base capable of affordably producing these displays. Prior to this, Marconi conducted a research and development program to evaluate the

performance of this display technology, and Planar Systems Inc., had developed the AMEL technology for small displays. In 1997, the Air Force awarded a contract to Marconi/Planar to produce this AMEL flat panel for use in military applications.



The new NVIS EHUD system uses an AMEL flat panel display, a circuit card assembly with surface mounted commercial electronics and a high speed digital data cable in place of the fiber optic cable. The video symbol display unit is smaller, lighter and its hardware is available commercially. The electro-optical system superimposes flight and navigation symbology onto the scene viewed by operators of night vision goggles. The AMEL display technology increases the type of information normally viewed on the goggles with clear visual accuracy, and the mean time between failure increased with the new system from 450 hours to 10,000 hours. The NVIS EHUD costs 32 percent less than the old system, and has an integrated eye piece with rotational focus. During flight tests, users of the new system said it performed exceptionally well. The test group was very

satisfied with the ergonomically friendly design and functionality.

The Air Force has purchased four of the new units, and plans to buy an additional 96 units before October 2000, with a long range purchase of almost 500 units. This technology can be applied to 3,000 Army and Navy aircraft, and there are potential commercial applications with police departments and the U.S. Customs Service. Title III is a unique program in the DOD arsenal to maintain technology leadership. Its mission is to provide industry with financial incentives to create, expand and maintain assured, affordable and commercially viable production capacities for items essential to national defense. The Air Force is the executive agent for the Title III Program and program management is provided by ML's Manufacturing Technology Division. @